DOCUMENT RESUME

ED 273 790 CE 044 967

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TITLE Motivation for Postschool Training and Job Entry: Factors That Influence the Choice of Standard 10 Pupils. Research Finding MN-115.
INSTITUTION Human Sciences Research Council, Pretoria (South Africa).
REPORT NO ISBN-0-7969-0285-2
PUB DATE 86
NOTE 48p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; Aptitude; *Career Choice; Demography; *Education Work Relationship; Foreign Countries; Influences; *Outcomes of Education; Personality Traits; Post High School Guidance; Postsecondary Education; Research Needs; School Attitudes; *School Choice; Secondary Education; Student Characteristics; *Student Educational Objectives; Student Interests
IDENTIFIERS *South Africa

ABSTRACT

A study examined the influence of such variables as aptitude, interest, personality traits, attitudes and aspirations, school achievement, and background on the post-high school training and career choices of secondary school students in South Africa. Data from various sources, including the Project Talent Survey begun in 1965 and continued with follow-up tests until 1980, the Human Sciences Research Council (HSRC) Register of Graduates, the National Institute for Personnel Research, the HSRC's Centre for Child and Adult Guidance, and television research conducted by the HSRC were analyzed. Conclusive evidence exists that certain measurable variables such as school achievement, aptitude, interest, and some biographical characteristics can be used to develop statistical models for predicting study success and subject preferences. Persons such as guidance and subject teachers, parents, and friends do not have a marked effect on pupils' occupational choices and career decisions. Pupils' choice of school subjects and success in these are closely linked to intellectual potential and have a significant effect on pupils' postsecondary schooling and occupational choices. The lack of research on the effect of technology, urbanization, provision of training opportunities, population growth, and change in salary structures on pupils' occupational choices and career decisions became evident during the study. Such research should be conducted and used to develop guidance strategies and methods for use in industry and education. (MN)

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Research Finding MN-115

ED273790

Motivation for postschool training and job entry: Factors that influence the choice of Standard 10 pupils

J.H. Beukes
Translated by Lalie Rabie

U.S. DEPARTMENT OF EDUCATION
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Pretoria
Human Sciences Research Council
1986

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Translated from Afrikaans: "Motivering vir naskoolse opleiding en beroepstoetrede: Faktore wat st. 10-leerlinge se keuses beïnvloed." Raad vir Geesteswetenskaplike Navorsing, 1985

Institute for Manpower Research

Executive Director: S.S. Terblanche

ISBN 0 7969 0285 2

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Printed and published by HSRC

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SAMEVATTING

Die RGN se betrokkenheid by voorligtingnavorsing strek oor baie jare en behels beide dienslewering en navorsing. Die verslag bied 'n beknopte oorsig oor navorsing wat oor die loop van jare uitgevoer is met betrekking tot studie- en beroepskeuses en voorkeure van leerlinge en voornemende studente asook faktore wat die keuses beïnvloed.

Die meeste van die navorsing is gebaseer op buitengewoon omvattende databasisse wat die RGN gaandeweg opgebou het, soos Projek Talentopname, Register van Gegradueerdes, televisienavorsing, opnames oor die stand van natuurwetenskap-like vakke op skoolvlak, en gedokumenteerde diensrekords van die NIPN en die Sentrum vir Kinder- en Volwasseneleiding.

Die vraag na die samehang tussen vak- en studierigtingkeuses van leerlinge op sekondêreskoolvlak en die ontwikkeling van hulle verdere loopbane, vorm die sentrale tema van die meeste navorsingspublikasies wat in die verslag ter sake is. Onderlinge verbande tussen 'n groot reeks veranderlikes soos aanleg, belangstelling, persoonlikheidstrekke, houdings en aspirasies, skoolprestasies en biografiese eienskappe is in die navorsing blootgelê, terwyl baie van die studies uiteindelik uitgeloop het op die ontwikkeling van modelle vir die voorspelling van akademiese sukses op sowel skool- as tersiêreonderwysvlak.

ABSTRACT

The HSRC's involvement in guidance research extends over many years and also includes service rendering. The report provides a concise review of research conducted over the years with regard to the study and occupational choices and preferences of pupils and prospective students, as well as the factors influencing these choices.

Most of the research is based on information obtained from particularly comprehensive data bases developed by the HSRC over the years on the basis of inter alia Project Talent Survey, the Register of Graduates, research on the effect of television, surveys on the state of the natural sciences at school level, and documented serivce records of the NIPR and the Centre for Child and Adult Guidance.

The question concerning the relation between the choice of subjects and study fields of secondary school pupils and the further development of their careers, constitutes the central theme of the majority of research publications dealt with in the report. the research revealed the bearing that a large variety of variables such as aptitude, interest, personality traits, attitudes and aspirations, school achievements and certain biographical characteristics had on one another, while many of the studies contributed to the development of models for the prediction of academic success at both school and tertiary level.

MOTIVATION FOR POSTSCHOOL TRAINING AND JOB ENTRY: FACTORS THAT INFLUENCE THE CHOICE OF STANDARD 10 PUPILS

1 INTRODUCTION

A growing number of matriculants and early school leavers of all population groups annually enrol at the different training centres, while others enter the labour market direct. Many of these persons feel that they have made the correct decision regarding their field of study or work. The majority of school leavers, however, make this decision from a position of uncertainty and doubt. The findings of local research and the many requests for assistance, guidance and advice that vocational guidance services and tertiary training institutions receive from pupils in their last year of school, clearly indicate that the effect of the uncertainty factor among pupils regarding a correct, i.e. realistic or wise, choice of postschool field of training or work must be considerable. Together with this uncertainty the possibility of making a wrong choice obviously also increases. In addition boys face a two-year period of military service. For some of them this means postponing the choice of a career and possibly gaining wider experience as well as greater certainty on their future careers.

The problem of choosing the right occupation or career is no simple matter for matriculants. The findings of research in this regard as well as the practical experience of different service-oriented divisions in the HSRC, including the NIPR, have repeatedly confirmed that the uncertainty regarding the future careers of pupils, who are about to leave school permanently, has many dimensions. Grové (1983) inter alia regards the following as some of the more common reasons why pupils voluntarily report to an institution such as the NIPR for vocational guidance:

- To determine what their abilities and aptitudes are;
- to determine their potential for academic success;
- to obtain clarity on their occupational objectives;
- to eliminate uncertainties about career choices;
- to obtain professional support for their choice of occupation;

- to obtain suggestions on a variety of occupational choices;
- to obtain a recommendation in respect of a specific choice of occupation.

Although much is known about this uncertainty factor, the extent of the negative effect of the factor in terms of the number of pupils making wrong choices initially or taking irresponsible crucial decisions on their career future, is still largely indeterminable. Specialists are concerned that the negative effect may be so extensive that many matriculants and early school leavers end up in postschool training institutions, study fields and job opportunities that are unrelated to their skills, aptitudes and interests.

2 AIM OF THE REPORT

The HSRC's involvement in research on the factors related to the choices and decisions of matriculants and other school leavers regarding their career future extends over a relatively long period. For instance the NIPR's vocational guidance service dates from the early fifties, a period of more than 30 years of service rendering to the public (including numerous matriculants). The comprehensive set of service records thus documented and the wide experience gained have since lead to a number of scientific articles and other publications. Various other institutes of the HSRC have also contributed to research in this field, namely the Institutes for Manpower Research, Educational Research and Psychological and Edumetric Research and recently also the Institute for Communication Research. The themes researched so far cover a wide field of guidance issues and provide a variety of data.

In view of the importance of a meaningful choice of career, this report aims to provide a broad survey of the research conducted by the HSRC in this regard and to report briefly on the most important research findings. The findings should be seen in the light of the fact that the HSRC's involvement in guidance has always been reserch as well as service oriented. The report does not claim to be complete or to provide an exhaustive discussion on research results.

It is necessary to point out two matters regarding the HSRC's contribution in particular to this research. Firstly the HSRC has traditionally concerned itself mainly with applied and problem-oriented research in contrast to the universities which are pre-eminently suited to undertake mainly basic research. Although a clear distinction can never be drawn between basic and applied research in the human sciences, reports by the HSRC on guidance research undoubtedly tend to be largely of an applied nature.

Secondly, by using its extensive and well-developed infrastructure especially in respect of research support services, the HSRC has been able to develop various comprehensive data bases. Researchers outside the HSRC also have access to these data bases and much of the research reported in HSRC publications stems from their work.

3 DATA BASES USED IN THE RESEARCH

This report is mainly concerned with research conducted by the HSRC and its co-workers using the following data bases:

3.1 PROJECT TALENT SURVEY

Project Talent Survey, the most comprehensive long-term research project of its kind ever to be undertaken in South Africa, commenced in 1965 when 69 908 White Standard 6 pupils took part in an extensive test programme extending over five school days. Measurements were obtained of the pupils' background, intelligence, aptitude, interest, personality, adjustment and scholastic achievement.

These pupils were subjected to two follow-up test series in 1967 and 1969 when they were in Standard 8 and Standard 10. Pupils who continued their studies after Standard 10 were followed up in order to record any qualifications obtained up to 1980. The initial aim of the project was to determine the RSA's White manpower potential and to make data available with a view to optimal development of this potential.

The project has already led to approximately 80 research reports, the most important findings of which are contained in six summative reports (Roos 1974, 1975, 1976, 1977, 1979(a), 1980).

The comprehensive nature of this data set created the possibility of virtually unlimited research opportunities, not only in terms of the variety of themes requiring investigation, but also in terms of the many variations in methodological approach.

3.2 HSRC REGISTER OF GRADUATES

The HSRC Register of Graduates is a project that the HSRC launched in 1964 to establish a systematic data base for use by all natural and human scientists. The register was initially planned in such a way that it would

(a) at any time provide a picture of the RSA's graduate manpower,

(b) facilitate research on shortages in as well as the utilization and training of high-level manpower, and

(c) make the necessary information available to inter alia planners, counsellors and advisors.

Since the introduction of the register more than 60 publications have already been released in which register data were used, and literally hundreds of queries have been answered. The register currently contains approximately 203 000 entries on graduates, representing about 60 % of all graduates in the RSA. An important characteristic of the register is that it is updated regularly. This updating includes new entries as well as changes of address. Data on individual graduates that are entered in the register initially include the person's name, address, date of birth, qualifications, major subjects for B.degrees, occupation and rank.

So far the register has appeared to be very useful in research on wage levels and specific occupations. Both types of studies have had such

significance for guidance that a special series of publications (Career Guidance VR-6) based on the information generated by the studies has been published regularly since 1979 for distribution to inter alia educational institutions.

3.3 NATIONAL INSTITUTE FOR PERSONNEL RESEARCH (NIPR)

The NIPR has for the past 30 years been providing a career guidance service to persons over the age of 16 who are working or studying. This has led to the establishment of a data bank consisting of several thousand files. These files, which are based on individual consultations, contain information on biographical background, measured intellectual abilities, measured occupational and activity interest, measured personality traits and psychodynamic functioning as obtained from a comprehensive individual interview. Currently more than 4 000 clients are dealt with annually. In the course of the service rendering valuable knowledge and insights have been gained concerning the needs, techniques and research priorities for guidance, leading to various publications (Hall 1978, 1979, 1980; Raubenheimer 1979; Taylor 1978; Visser 1977; 1978; Skawran and De Jager 1975; Grové 1983).

3.4 CENTRE FOR CHILD AND ADULT GUIDANCE

The HSRC's Centre for Child and Adult Guidance, which falls under the Institute for Psychological and Edumetric Research, was established in 1981 and until now has dealt with approximately 700 clients with problems relating to career and subject choice. Along the same lines as the NIPR, the centre has established a data source of individual files containing information on inter alia biographical background, measured intelligence and occupational interest and measured aptitude and personality traits. The centre is at present conducting a survey of the information needs of communities in the RSA. On account of the relatively limited data base that the centre has established during its short existence, there has been no opportunity so far for any really comprehensive research on guidance issues.

3.5 INVESTIGATION INTO THE STATE OF NATURAL SCIENCE SUBJECTS AT SECONDARY SCHOOL LEVEL

During 1976-77 a large-scale investigation into the state of natural science subjects at White secondary schools got under way. The investigation resulted from the growing concern about the lack of popularity of some natural science subjects at school and tertiary education level, as well as the apparent ineffectiveness of programmes aimed at recruiting well-qualified teachers for these subjects. The syllabus content of the different subjects and other problems emerging from the teaching of the subjects also gave rise to concern. Apart from heads of secondary schools and a large number of teachers involved in the teaching of Physical Science, General Science, Biology, Physiology and Mathematics, approximately 5 000 Standard 10 pupils participated in the investigation. A number of reports have resulted from this research, two of which are especially concerned with the views and preferences of Standard 10 pupils regarding the particular subjects as well as their reasons for taking these subjects (Swanepoel 1982, 1984).

3.6 TELEVISION RESEARCH BY THE HSRC

The introduction of television in the RSA at the beginning of 1976 created a unique opportunity for research regarding the effect of this medium on inter alia the occupational interests of the youth. To make optimal use of this opportunity the HSRC planned a series of research projects well in advance, to determine the general effect of television. The most extensive of these projects, namely the investigation into the effect of television on the school-going youth was carried out in collaboration with the four provincial education departments and the SABC.

The project made use of particularly large samples. For instance, during 1974 more than 20 000 children between the age of 10 and 18 were included in a comprehensive test programme involving 14 different questionnaires and psychometric measuring instruments. In the research that followed the test groups were divided into television viewers (or heavy viewers) and non-television viewers (or light viewers) on the

basis of their television-viewing habits. Consequently careful analyses could be made of inter alia patterns of television use, programme preferences, homework patterns, study habits and attitudes, reading patterns, sports activities and hobbies, occupational interests, views, personality and the effect of television on the above.

The data base accordingly established was used by various researchers outside the HSRC.

4 THE POSSIBLE EFFECT OF MARKET-RELATED FACTORS ON THE OCCUPATIONAL PREFERENCES OF PUPILS

Before providing a survey of the findings of HSRC research regarding factors that play a role in pupils' choice of occupation, it is necessary to refer briefly to certain given market-related factors that undoubtedly influence the occupational preferences of pupils but on which there is relatively little information, partly because of the constraints placed by the available HSRC data sources at this stage on really meaningful research. These factors include manpower supply and demand, the effect of raising the educational level, change in salary structures and technological developments.

It is known that both the supply of and demand for manpower are strongly influenced by the provision of education, technological development, growing industrialization and urbanization. It is also known that the composition of a country's labour force is simultaneously the cause and effect for instance of its political and economic history, its population composition, its available raw materials and natural resources and its agricultural potential. That these factors will by implication play a role in the choice of occupation of entrants to the labour market can be assumed with reasonable certainty. Unfortunately it is seldom practically possible to illustrate these effects in terms of actual scientific supply and demand studies. For occupations in which a fixed relation for instance exists between training and occupation (e.g. medicine, engineering), it is possible to make estimates at micro-level within certain parameters particularly of the supply according to certain recognized methods. The vast majority of occupa-

tions, however, have no clear links with formal school or university education (Terblanche and Jacobs 1983). In other words, the majority of occupations lack a clear relation with formal training.

The following comments serve only by way of orientation to illustrate the implications that certain important market-related factors may have for the occupational preferences of matriculants and other potential entrants to the labour market.

(a) Supply and demand

The supply of and demand for manpower form part of the same economic reality. The demand for manpower can be regarded as an indication of the demand for services and goods, i.e. the level of economic activity, while the supply of manpower on the other hand has a determining effect on the level of economic activity that can be achieved. Research has shown how the influx of entrants to the labour market is strongly influenced by both the supply of and demand for manpower, particularly in respect of certain occupations and sectors. This frequently occurs in such a way that supply does not match demand. During an economic upswing when there is a sharp increase in the demand for goods and services, a shortage of manpower in particular is experienced in certain trades, technical and engineering fields with a corresponding increase in wages. The higher wages lead to a higher influx of school leavers to training institutions, who on completing a training period of three to five years, will enter the labour market when an economic downswing may already be in progress with the demand for job opportunities thus exceeding the supply. What actually occurs in practice is that the effects of economic highs and lows on the provision of manpower are channelled in different ways. For instance, during a recession employers may decrease the number of available bursaries or limit the number of apprentices, and during an economic upswing recruit workers by offering unrealistically high salaries. Ideally the imbalance between supply and demand should be transformed into a system of steady inflow where shortages or surpluses cannot cause any serious disruption. That this has not yet been achieved despite the impressive long-term education and training programmes introduced, is evidence of the strong

effect that shortages and surpluses in the labour market indeed have on the occupational preferences of entrants.

(b) Raising the educational level

In their report The manpower scene 1983 Terblanche et al. indicate that a future rise in the general level of education of Blacks is likely to have a definite effect on the occupational or job preferences and aspirations of workers. Whereas the needs of many workers currently centre on the basic needs for food, shelter and security, a rise in the training level of workers will create new needs such as more and better opportunities of promotion, more responsibility in the work context and opportunities for full self-realization. The more opportunities of fulfilling these needs that are created by certain occupational fields, economic sectors and employers, the greater will be their appeal one way or another for entrants to the labour market.

Another important implication of a rise in the general training level of the labour force is that the base of trainable manpower is thus broadened, irrespective of the difference in educational standards. This as such obviously leads to the establishment of facilities and opportunities for further training by employers. Such facilities and opportunities are normally considered very seriously by potential career entrants, as has been repeatedly pointed out in investigations into the job satisfaction of employees in specific occupations. The actual impact of this benefit on the occupational preferences of Standard 10 pupils, as in the case of other benefits, will relate to the guidance that they receive in this regard.

HSRC studies on the profitability of occupations, notwithstanding the weak relation between training and occupation, have shown that further training is advantageous whatever the level, and it would be naive to believe that this benefit would not have a guiding effect on the occupational preferences and career decisions of matriculants and even graduates.

(c) Change in salary structures

It is commonly believed that salaries and other financial benefits have a particularly strong guiding effect on the occupational preferences of potential entrants to the labour market, i.e. that the price mechanism (wage) has a strong bearing on the allocation of labour. According to Stumpf and Van Pletzen (1982), however, there are considerable differences of opinion on the way in which wages influence the supply of and demand for manpower. In an investigation that they conducted it was indicated how certain biographical variables such as age, sex, qualification level and experience have a significant effect on the salary structure of graduate teachers. Unfortunately no research results are available that indicate the direct relation between salary structures and occupational preferences.

It is nevertheless important to note that in various investigations into the job satisfaction of certain categories of highlevel workers it was frequently found that financial remuneration and benefits did not weigh more heavily than for instance opportunity for self-realization, promotional opportunities and service rendering. It is also interesting to point out that in an investigation into the work situation of new graduates (Terblanche 1981) it was found that they generally had particularly realistic salary expectations, indicating that salary could not have been an all-important factor. However this finding normally holds only for high-level manpower where the majority of workers are usually assured of relatively good wages. In jobs that by and large do not offer much of a challenge workers have a different attitude towards wages. They regard wages as the means to an end, with the latter being important to life.

From an investigation into joint taxation and the participation of married women in the labour market the interesting fact emerged that married women's decision to work away from home and thus earn an income is motivated by a desire to improve the standard of living of the family (i.e. financial considerations) as well as to achieve self-realization and to create an opportunity for social contact (52 : 21). Although the finding of the particular investigation cannot be directly

related to the initial choice of a career or study field, it nevertheless appears that financial considerations do not have the same impact on the career decisions and preferences of women as in the case of men. However the complexity of factors that play a role in women's participation or non-participation in the labour market has not been sufficiently researched for these findings to be regarded as conclusive.

(d) Technological development

We know that technological development affects people's lives in various ways. When planning a career this is therefore one factor that should be carefully taken into account. The use of modern technology usually means a change in job content, but the implications are often vastly more far-reaching and may even involve the phasing in or phasing out of job opportunities.

Calculating the possible impact of technological development on the availability of manpower and job opportunities statistically is a difficult if not impossible task, but that technology is bound to have an eventual effect on the channelling of occupational preferences and aspirations of entrants to the labour market can hardly be doubted. The apparently wide interest in occupational fields relating to electronics and the computer one way or another is probably a sign of this. By way of illustration it can be mentioned that the number of job opportunities in the so-called information industry (which is largely technologically oriented) is expected to increase strongly at the expense of other labour-based job opportunities. Similarly, in the manufacturing industry where no rapid increase in job opportunities is expected, specialized fields such as microtechnology, biotechnology, fibreglass technology, optical technology and communication technology are nevertheless expected to expand dramatically.

The need to consider the issue from a research perspective probably cannot be denied even though this field does pose certain methodological problems with regard to concrete empirical research.

(e) Other factors

The above list of factors cannot be regarded as complete. Other factors can also be identified which individually or collectively have a guiding influence on the occupational preferences of matriculants and other potential entrants to the labour market. These factors include amendments in labour legislation, structural changes in the composition of the labour market, geographic and climatic factors and urbanization trends. Unfortunately little is known about the impact of these factors on the choice of career of matriculants.

5 SURVEY OF RESEARCH RESULTS

5.1 PRESENTATION OF RESEARCH FINDINGS

The question on the relation between the choice of subjects and study field of school pupils and further career development is central to most of the research publications dealt with in this report. In order to classify and define the problems regarding initial choice of occupation or career more effectively, a distinction is made between research findings respectively relating to choice of subjects and study field at school level and occupational and career choices after school. This however does not indicate that the research reports can be divided into two clearly distinguishable categories, or that these two aspects were separately dealt with in the research.

5.2 RESEARCH FINDINGS ON FACTORS RELATING TO CHOICE OF SUBJECTS AND STUDY FIELD AT SCHOOL LEVEL

The research conducted in this field was based mainly on the data of Project Talent Survey, while the investigation into the state of the natural science subjects at secondary school level also paid some attention to this matter.

Project Talent Survey was launched prior to the introduction of the current system of differentiated education with its particular choice of subject groupings and study fields. In other words, where subject

and study field preferences at school level are concerned, the results of Project Talent Survey cannot be applied to the present situation without certain reservations. This restriction does not hold however for the investigation into the state of the natural science subjects.

Both programmes, i.e. Project Talent Survey and the investigation relating to the physical sciences, involved questionnaire surveys and most of the research regarding factors that influence the choices and preferences of pupils were based on the questionnaire data. With regard to Project Talent Survey, all three surveys (the 1965 survey among Standard 6 pupils, the 1967 survey among Standard 8 pupils and the 1969 survey among Standard 10 pupils) included questions in the biographical questionnaire requiring pupils to state their subject and study field preferences as well as the reasons for these preferences. The frequency distribution of pupils' responses to the questions was set out fully in earlier HSRC publications (Roos 1970(a), 1972, 1975) and further analyses of the responses to some of the questions were made in later investigations (Scheffer 1972; Engelbrecht 1973, 1974, 1975; Van Vuuren 1975; De Beer 1977; Coetzee 1979). Most of the investigations attempted to identify and describe the mutual relations between particular characteristics such as aptitude, interest, personality traits, attitudes and aspirations, biographical characteristics and scholastic achievements. Although the statistical analysis techniques used in most of the investigations were mainly of a descriptive nature and the theoretical basis presented for the interpretation of the results was mainly of an eclectic nature, valuable information nevertheless emerged from the research. The information was supplemented significantly by a series of studies undertaken to determine the validity of certain HSRC tests for the prediction of scholastic and academic achievement, i.e. the development of models for predicting academic success at school and later also at university (Lätti 1972; Ackerman 1973; Schoeman 1978; Verwey 1982; Roos 1984; Smit 1983).

For understandable reasons all the results of the above research are not reported here, but only those findings relating to a greater or lesser extent to factors that appeared to influence the choice of subject or study field in the school context as well as the decision to leave school prior to Standard 10.

(a) The first matter that stands out clearly is the very close relation between pupils' subject choice and subject preferences and their intellectual potential as measured by certain cognitive tests such as the NSAGT and the SAT (Roos 1983; Coetzee 1979). This relation was confirmed in almost every investigation and applied irrespective of differences in language or sex. According to all the investigations based on the data of Project Talent Survey, pupils with above average intellectual ability (IQ > 112) tended to prefer Mathematics and a third language. The preference for a third language should naturally be seen in the light of mathematics or a third language being required prior to 1976 for matriculation exemption and therefore university study.

Apart from intellectual ability, difference in sex was a strong determinant of subject choice and subject preference. For instance from Coetzee's (1979) investigation it appeared that girls gave preference to languages and human science subjects, while boys preferred Mathematics and natural science subjects. Commercial or economics-oriented subjects appealed to boys and girls to the same extent. It is doubtful whether there has since been any significant change in this trend.

(b) Van Vuuren (1975) investigated the possible effect that uncertainty on their career future may have on pupils in respect of their choice of subjects. He found inter alia that pupils who gave preference to Mathematics, the natural sciences and languages experienced greater uncertainty about their choice of occupation than pupils with a preference for the commercial, technical and agricultural subjects and Home Economics. The reason for this lies mainly in the wider spectrum of occupational and study opportunities offered by the first group of subjects, as well as the fact that pupils with a preference for these subjects are associated with a higher intellectual ability and are therefore capable of sensing a wider spectrum of alternative choices.

(c) Socio-economic status as one of the most important determinants of the educational and occupational aspirations of pupils was investigated by Scheffer (1972). In his investigation into the effect of socio-economic status on the education of a group of Afrikaans-speaking high school boys he found that although there was a relation between socio-

economic status and subject preferences, intellectual potential largely cancelled the effect of this. The test group was divided into three socio-economic groups, namely high, average and low according to the occupations of the fathers. After analysing the effect of differences in socio-economic status on a wide variety of variables, the researcher concluded that when the social status and not the intellectual ability is kept constant, the differences between pupils in respect of subject preferences emerge much more clearly than otherwise. For instance Scheffer was able to indicate that the preferences in respect of subjects and study field of pupils with a high IQ > 112) did not differ for the various social status groups, while only slight differences occurred in pupils with an average IQ (IQ < 111). Also noteworthy is the finding that there was a significantly stronger statistical relation between socio-economic status and intellectual ability than between socio-economic status and subject preferences.

(d) Although subject choice and subject preference are not directly concerned it is meaningful to refer briefly to early school leaving and the factors leading up to it. In 1977 De Beer conducted an investigation into background factors related to early school leaving among secondary school pupils in the PWV area by means of Talent Survey data. Factors identified as having some bearing on this included size of family, divorce, educational level of family members, school achievements, aspirations of pupils and of parents and socio-economic status of parents. After analysing the data, as in the case of Scheffer, he found that intellectual potential was the strongest indication of early school leaving. The higher the intellectual potential, the less the risk of early school leaving and vice versa. For instance it appeared that approximately 17 % of the pupils with a high intellectual potential (IQ > 112) left school prior to Standard 10 in contrast to approximately 30 % of those with an average intellectual potential (89 < IQ 111). Another interesting finding of the investigation is that certain attitudes and aspirations of pupils are related to early school leaving. For instance, in contrast to pupils who do not leave school prior to Standard 10, early school leavers to a greater extent aspire to lower socio-economic occupations and an accompanying lower level of education. As expected, the early school leavers generally revealed a

less favourable attitude towards school, homework, education and school rules. Underlying this comparatively unfavourable attitude and the tendency towards a lower aspiration milieu is a strong statistical relation with intellectual potential, which serves to confirm the particular significance of the latter for pupils' career development.

(i) Standard 10 pupils who perform well (60 % and higher) in any of the subjects Mathematics, Physical Science and Biology also tend to like the subjects more than pupils who obtain only 50 % and lower.

(ii) No relation could be found between pupils who regard Physical Science and Biology as their favourite subjects and IQ, while a positive relation does appear to exist between IQ and Mathematics as favourite subject. According to this relation pupils with an IQ of 120 and higher tend to like the subject more than the rest of the pupils.

(iii) Pupils who take Mathematics in Standards 8, 9 and 10 do so for a variety of reasons of which the following appear to be the most important.

- Knowledge of Mathematics regarded as useful (79,7 %)
- Liked the subject (68,3 %)
- Subject necessarily included in the subject package (64,1 %)

(iv) As opposed to this pupils who preferred not to take Mathematics gave the following reasons:

- Poor achievement in Standard 6 and 7 (63 %)
- Regarded Mathematics as uninteresting (61,2 %)
- Feared that they would fail Mathematics in Standard 10 (59,8 %)
- Considered Mathematics a difficult subject (57,9 %)

(v) Approximately the same considerations applied in deciding whether or not to take Physical Science and Biology as subjects.

(vi) None of the investigations were able to confirm that pupils' decision to take any of the three subjects concerned was influenced by

foreknowlege of the presentation of the subjects in Standards 8, 9 and 10. It was found, however, that pupils who chose Mathematics and/or Physical Science were advised mainly by their parents (87,7 %), followed by their Mathematics teachers (47,5 %) and the school principal (22,0 %). Very few of the pupils regarded guidance within or outside the school context as a determining factor. Those who decided not to take a subject such as Mathematics did so mainly on the advice of their subject teachers in Standard 7 (59,2 %), followed by their parents (37,9 %) and fellow pupils (35,9 %).

(vii) The investigation also found that the decline in the popularity of particularly Mathematics and Physical Science as key subjects in the training of technical manpower, according to teachers involved in the teaching of the subjects was due to the long and difficult syllabuses as well as the lack of adequately trained teachers to present the subjects.

(viii) Finally it is important to note that the allegation that many pupils who have the ability to pass Mathematics at school, prefer not to take the subject, could not be confirmed by any of the research. In fact, according to Project Talent Survey, 99 % of the intellectually superior boys took Mathematics in Standard 10, as well as 85 % of the girls (Roos 1983). Unfortunately no particulars are available with regard to Black, Coloured and Indian pupils.

5.3 RESEARCH FINDINGS ON FACTORS RELATING TO THE CHOICE OF STUDY FIELD AND OCCUPATION OF MATRICULANTS

In the HSRC considerably more research has been done on factors relating to pupils' choice in respect of postschool training and occupation than on choice of subject and study field at school level and pupils' preferences in this regard.

Project Talent Survey alone gave rise to approximately ten reports centring on various aspects of the above, while further input was made by the investigation into the state of the natural science subjects, the television surveys and NIPR research projects. Many of the

research projects were based exclusively on questionnaire surveys in which pupils were given the opportunity to give their views inter alia on their occupational preferences and dislikes, career planning and aspirations for further study. Some of the more recent research was conducted with a view to developing achievement profiles for certain clearly distinguishable tertiary fields of study. Unlike the earlier research that was based mainly on questionnaire surveys, these studies were based mainly on certain measured variables such as intellectual ability, aptitude, interest and personality traits.

The research findings to be dealt with in this section will be presented under the following headings: attitudes, preferences, interests and aspirations; influencing by persons/institutions/guidance, and academic and test achievements. Unfortunately relatively little research has been done in respect of Blacks, Coloured and Indians in this regard, with the result that most of the research results included in the report related mainly to White pupils.

6 ATTITUDES, PREFERENCES, INTERESTS AND ASPIRATIONS

(a) The importance of education and training is generally considered very highly by all population groups in the RSA, as illustrated by the growing numbers of Blacks, Coloureds and Indians who study up to Standard 10 and further. The average growth rate of the number of senior certificates issued from 1972 to 1982 is in the order of 18 % for Indians, 13 % for Blacks, 12 % for Coloureds and 5 % for Whites (Terblanche 1984). With regard to Whites, questionnaire surveys undertaken during Project Talent Survey indicated that almost all the Standard 10 pupils had a favourable attitude towards education. The boys regarded it as important because they associated education primarily with progress in life, while the girls considered the formative aspect of education to be important (Coetzee 1979). Although similar surveys have not been conducted in respect of the other population groups, there is sufficient indication that the same trend will be present there.

(b) White pupils' views regarding their career future are characterized by a particularly strong streak of realism. According to Roos (1975(a)) the responses of a group of Standard 10 pupils to a question regarding the importance of a given set of considerations in their choice of a career were as follows:

(a) It should interest me (85,8 %)
(b) Enable me to give full expression to my aptitude and abilities (55,2 %)
(c) Pleasant working conditions (51,3 %)
(d) Good prospects for promotion (49,6 %)
(e) Good income (36,8 %)
(f) To serve my fellow men (34,6 %)
(g) To practise my Christian principles to the best of my ability (34,2 %)
(h) Good opportunities for further study (27,2 %)
(i) To satisfy my parents (24,2 %)
(j) Status and prestige (9,4 %)

From the above it appears that preference is generally given to considerations that should in the long run provide the most enduring satisfaction with respect to choosing and practising a career. In his investigation into sexual differences in tertiary education and training, Coetzee (1979) found that boys and girls allocated different weights to the considerations. Both sexes agreed that interest in the occupation should be the most important consideration, but whereas girls tended to attach greater importance to service considerations, boys tended to regard good prospects for promotion in an occupation as well as a good income as important. Despite all the indications that women are becoming increasingly economically active and are rapidly entering the labour market, Coetzee believes that boys and girls at least as far as the South African White community is concerned, definitely still differ in respect of their occupational orientation.

Also worth noting is Van Vuuren's finding (1976) in his research on career choice uncertainty among a group of Standard 10 pupils, namely that responsible and apparently realistic considerations do not make

the difference between certainty and uncertainty in respect of career choice. Certain and uncertain pupils allocated approximately the same weights to the different considerations.

Where the youth of other population groups are concerned, relatively little is known in this regard. Slabbert (1982) found in his investigation into the occupational and work preferences of the Black youth that working conditions and job security were regarded as important considerations. Unfortunately the findings of this investigation cannot be compared directly with those of Project Talent Survey because of differences in size and place of survey and in the composition of the survey groups.

(c) The occupational aspirations of pupils are not unrelated to their home and educational environment. These aspirations are generally characterized by a strong degree of realism. According to Project Talent Survey White parents by and large have high but realistic expectations of their children in respect of further training and the practising of an occupation. In his investigation Coetzee (1979) found that the occupational aspirations of pupils tended to be even higher than their parents' aspirations for them, and in some cases even showed signs of unrealism. Although insufficient research results are available in this regard, it is suspected that in the case of Blacks the aspirations of parents do not have as marked an impact on the aspirations of their children.

(d) Pupils' intentions in respect of further training appear to a surprising extent to be not only an indication of their aspirations, but also of their determination to carry out their intentions. For instance between 80 and 90 % of the Standard 10 pupils in 1969 who had indicated that they intended studying further, did indeed do so and also obtained a qualification eventually. This points to a relatively small loss of potential, bearing in mind particularly that approximately 27 % of those who continued their studies after school failed their first year of study but then continued their studies so that only 14 % of the group eventually failed to obtain a postschool qualification.

Another interesting fact is that the plans of prospective university students appear to be realized better than those of technikon or teaching college students. The plans regarding further study of approximately 85 % of the prospective university students were realized in that they did study at a university, while the plans in respect of advanced technical training of only approximately 50 % of the men were successfully realized in that they qualified at a technikon. For the Standard 10 girls the corresponding figure was 70 %. Approximately 30 % of the Standard 10 boys who intended studying at university ended up at technikons, in most cases probably because they failed to meet the requirements for university study. Approximately the same situation prevailed in respect of prospective teaching college students (Roos 1979(a)).

(e) The following comments based on an informal survey among 10 guidance counsellors of the NIPR in Pretoria also warrant attention within the context of this report.

- Most matriculants who visit the NIPR in Pretoria for career guidance do not yet have <u>any</u> clarity on a likely choice of occupation and are hopeful that the guidance session will help them to make up their minds.

- Most matriculants regard the role of school guidance or of the guidance teacher as insignificant.

- Boys assume that they have technical aptitude and interests - at the expense of other possibilities that are only pointed out to them during testing.

- A very important factor strongly endorsed by all the vocational counsellors is the enforced reality concept instilled in the matriculants by university selection for the medical, dental and veterinary fields of study. This selection focus the matriculants to look realistically at their abilities and achievements and to make alternative and more appropriate choices if they are not selected. Vocational counsellors strongly feel that selection in all tertiary

fields of study can play a significant role in realistic career choices and eventually in manpower provision.

- Girls appear to be more realistic regarding their potential, interests and resulting occupational choices than boys.

- Pupils who perform well at school have little difficulty choosing an occupation and are also more realistic in their choice than underachievers or pupils whose achievement is poor, probably because they have a much wider choice.

- The engineering professions still have status value among both boys and girls, and many students who choose these fields have only university study in mind and are completely unrealistic about the demands that the field concerned will make on them. They also have difficulty choosing alternative fields and show resistance towards other fields or the idea of following an engineering course at a technikon.

- Pupils of urban high schools are better informed on study fields and more flexible in their choice than pupils of rural schools.

- B.Com. and computer studies are currently the most popular fields of study by far among pupils who already have a field of study in mind.

- The most significant sources of information on occupational choices currently available appear to be the publications of the Department of Manpower and the HSRC that are distributed to schools. Information can also be found in technikon and university yearbooks. The occupations practised by parents - with the exception of the engineering and natural science professions - have an insignificant effect on the occupational choices of children. The media and TV in particular appear to play a predominant role only in choices of occupation in nature conservation, while mission camps stimulate choices in religious occupations in a smaller percentage of matriculants.

(f) With regard to study field and occupational preferences of Standard 10 pupils in particular, it is difficult to identify particular trends or patterns of preference on the basis of a number of independent surveys. To use the data for education planning purposes can be very risky. It is nevertheless interesting to note briefly the results of the following surveys:

A survey in 1977 among a 10 % sample of White matriculants in the RSA indicated that the economics, commercial and engineering fields of study represented the fields of highest preference among boys who gave preference to university training, while the majority of girls preferred fields of study in languages. Approximately 40 % of the boys and 30 % of the girls wanted to obtain a degree in the natural sciences. Unfortunately no follow-up studies were undertaken to determine the extent to which their aspirations were realized (Swanepoel 1982).

Project Talent Survey likewise collected data on the occupational preferences of pupils, but relatively little follow-up research was conducted for further analysis of the responses. Coetzee (1979) identified certain differences in the preferences of boys and girls and found that there must be a fairly positive relation between the occupational field that interested boys and girls the most and their favourite subject or subject field. According to the investigation, the sex-based differences in subject and occupational fields that occur at secondary school level account significantly for the differences in study fields at tertiary level and those in respect of entry into the labour market between men and women.

In his research on the realism of occupational choice among the Black youth, Taljaard (1982) found that the situation did not differ much from that for Whites. For instance he found that the boys in his survey group generally tended to indicate the so-called prestige professions (medicine, engineering) as preferences, while the girls, like their White counterparts, were more attracted to the social or service professions. During the investigation the realism of the pupil's choice of occupation was weighed against their school subjects and their achievement in these subjects. It was accordingly found that

most pupils' occupational choices could be regarded as unrealistic and that they generally tended to overestimate their own abilities.

In contrast to this, Slabbert (1982) found in his investigation into the labour potential of a group of Black youths in the Pretoria area that in most cases their occupational aspirations tied in with their level of training. Because a large portion of the test group already had had two years' experience in the labour market, they were probably forced to a much more realistic level than they initially had, as Taljaard found in his investigation among Black school pupils.

(g) Although most of the research regarding occupational and study field preferences was conducted among school pupils, some studies were also undertaken in which persons practising certain occupations were asked to give their reasons for choosing a particular field. The findings of all these investigations clearly point to interest and aptitude as the predominant considerations. For instance Hirschowitz (1985) found in her investigation into the work situation of a group of natural science graduates that the following considerations inter alia applied in order of importance: interest, good marks achieved at school, career prospects, job opportunities, advice of parents or other relatives, status of occupation, availability of bursaries.

6.1 INFLUENCING BY PERSONS/INSTITUTIONS/GUIDANCE

Matriculants and other school leavers facing important decisions on their occupational future, turn to all available sources in the hope of finding greater clarity and certainty on their choices. These sources are the news media including television, any other form of documented information, persons as well as institutions. It is generally believed that many of the pupils eventually succumb to recruitment campaigns by persons or institutions, thus ending up in occupations that later appear to be unrelated to their interests. The reluctance of schools to allow outsiders to address pupils on certain occupations or study fields during school hours should perhaps be seen in this light. From HSRC research in this regard certain matters regarding the effectiveness of external influencing by persons, institutions and guidance services have emerged clearly, the following being the most important:

(i) School guidance does not have any notable effect on the choice of occupation of most pupils. Even where subjects or school study fields are concerned, guidance appears to have little effect on most pupils. Subject teachers have a much stronger influence as was clearly illustrated by Swanepoel's investigation (1982). When an occupational choice is considered, however, the direct influence of the subject teacher apparently also declines in accordance with an increase in responsibility on the pupil's part. According to Coetzee (1979), approximately 60 % of the pupils accepted full responsibility for their own decisions without any awareness of anyone having influenced them. He also found this to be the case even slightly more for girls than for boys.

That this is indeed the case is confirmed by Van Vuuren's finding that uncertainty regarding occupational choice is not determined by whether or not a pupil feels that he/she was influenced by someone else. On the contrary the uncertainty that they experience probably stems from an instinctive feeling that the choice of an occupation remains basically his/her own responsibility regardless of attempts by others to influence this decision. The only people who apparently do exercise an influence are pupils' parents, and then only in about 10 % of cases according to Project Talent Survey.

When it comes to the discussion of future plans it is again the parents who enjoy the confidence of most pupils. However, it is suspected that subject teachers probably have more influence than pupils tend to acknowledge in their questionnaire responses. This is confirmed in part by Cilliers' (1979) research on the working conditions of entrants to the labour market and Swanepoel's (1982) investigation into the natural sciences when they indicate that the subjects taken at school definitely have a guiding influence on the eventual choice of an occupation.

(ii) The media and particularly television are widely regarded as important sources of information on different aspects of occupational choice, and as such they probably represent very important opinion formers. In an investigation into the effect of television on school-

going children, attention was explicitly paid to the possible effect of television on the interest patterns of White Standard 8, 9 and 10 pupils in the RSA.

The latest findings indicate that television does have an effect on pupils' interest in particular fields as measured by certain interest questionnaires (De Beer 1980, 1981). For example it was found that the introduction of television not only marked a general change in interest trends, but also stimulated pupils' interest in certain fields and reduced it in other fields. The content of certain types of television programmes probably contributed to this. Unfortunately the programmes televized during the investigation did not offer a realistic picture of all occupations. An analysis of programme content at the time of the investigation indicated for instance that certain occupations (e.g. law-related occupations) were twenty times overrepresented as well as presented in an unrealistically successful and competent light, while other occupations (e.g. nursing) were underrepresented. These investigations conluded in general that television does have the potential to influence children's occupational interests.

6.2 ACADEMIC AND TEST ACHIEVEMENTS

Study success with a view to entering an occupation and practising it successfully can be individually and collectively regarded as valid indicators of occupational success. When particular characteristics of the person practising an occupation are related to any of these yardsticks, a so-called achievement profile is developed. This profile can then serve as a comparative measure of an individual's potential in order to determine whether he will be successful in his training, whether he will be able to enter a specific occupation, and whether he will be able to practise his occupation successfully. The HSRC has also contributed in respect of such profiles, some of which are concerned only with matric or tertiary study success and a few with occupational success. Most research in this regard was conducted with data of Project Talent Survey, and the most important contributions can be summarized as follows:

With the HSRC Register of Graduates as data base the Institute for Manpower Research conducted occupational studies on various high-level occupations. Most of the studies contain a description of aptitude and interest profiles as obtained from the measured test achievements of the practitioners of the different occupations. The profiles that are based on data of Project Talent Survey basically entail a graphically represented statistical description of the mean scores obtained in certain standardized tests. The profiles are of a descriptive nature only, but no validity tests have been conducted to determine their predictive value.

Apart from the profiles which have limited implementation value, the HSRC conducted research on factors related to study success, particularly in respect of pupils with above average intellectual abilities. Some of the investigations were meant to be mainly descriptive (Engelbrecht 1973), while others resulted in the development of predictive models (Schoeman 1978) for academic success and in the establishment of achievement profiles (Roos 1984). Although none of the particular studies focused on motivation factors as such, the findings are nevertheless relevant in this respect. In his research on the prediction of scholastic success Schoeman (1978) took 36 intellectual and 24 non-intellectual factors into account. The survey group consisted only of Afrikaans-speaking boys and girls, all of whom were Standard 10 pupils at provincial schools in the OFS in 1969. As dependent variable he used the average percentage obtained in Standard 10. Of the 60 independent variables, Schoeman could identify only 41 (most of which were intellectual variables) that correlated significantly with the average Standard 10 achievement. In related investigations conducted by Engelbrecht (1973, 1974) the emphasis was on the academic achievements of intellectually above-average pupils (IQ > 112). Complete tables and descriptions of the effect of home background, school factors and related biographical matters, as well as of intellectual factors, personality, adjustment and interest, self-concept and personal assessment, and study habits and attitudes on the academic achievements of the pupils are provided in the different publications. Some of the most important findings of the series of investigations based on the data of Project Talent Survey indicated inter alia that the percentage

of boys with an IQ of 112 and higher who failed Standard 10 (8,4 %) gave less cause for concern than the relatively high percentage of successful Standard 10 boys who did not study further (36,7 %). The situation does not differ much in respect of the girls except that they appeared to be more successful in their first year of study after school than the boys.

In probably one of the most important investigations conducted so far with data of Project Talent Survey, Roos (1984) identified achievement profiles for eight broad fields of study at universities by means of multiple analysis techniques. These broad fields are: applied natural sciences; pure human sciences; engineering; medicine; dental and veterinary science; law, commerce and administration. The particular importance of the investigation lies in the ability of a wide series of standardized HSRC tests to predict study success in various general university fields of study at Standard 6, 8 and 10 level so that these measurements can be used to help pupils to choose an appropriate field of study and/or occupation. The criterion for the achievement profiles used in the investigation is not work or occupational success but only study success.

Because the investigation was based on the data of Project Talent Survey, the same measuring instruments were also used to establish the profiles: the New South African Group Test (NSAGT), Junior Aptitude Tests (JAT), Senior Aptitude Tests (SAT), General Tests of Language and Arithmetic (GTLA), General Science Test (GST), Scholastic Proficiency Battery (SPB), Mathemathics Tests (Geometry and Algebra), GSZ Interest Inventory (GSZ), 19 Field Interest Inventory (19 FII), Junior/Senior High School Personality Questionnaire (HSPQ), Adjustment Questionnaire, and Survey of Study Habits and Attitudes (SSHA).

It eventually appeared that all the tests had sufficient validity (some more than others) to distinguish between the above fields of study. For instance it seemed the interest inventories distinguished best, followed by the scholastic proficiency tests, cognitive tests and finally personality and other tests. Seen as a whole the investigation focused anew on the particular impact of interest, along with cognitive

factors, on the future study and occupational choice of pupils, a theme that is fairly central to most of the research dealt with in this report.

Another study that warrants attention in the context of this report is the recent investigation into the differential entrance requirements of tertiary education institutions (Stoker 1984). The investigation was undertaken at the request of the Joint Matriculation Board (JMB) with the purpose of developing realistic predictive models for a number of defined study fields at different types of tertiary institutions by means of Standard 10 achievement. The most important findings of the investigation can be summarized as follows: Of the different explanatory variables used, school aggregate throughout appeared to account best for most of the variation in tertiary study success. For example it was found that increasing the school aggregate from 950 to 1 050 marks would have "unfairly" barred a small percentage of successful students from university study, whereas their chance of success at technikons, teaching colleges and nursing colleges would have been considerably improved. It was also indicated how the Standard 10 achievement in a particular combination of school subjects could readily predict successful tertiary study in different fields. This follows the finding that apart from school aggregate, a number of other variables have a bearing on Standard 10 achievement. One predictive model could therefore at best be regarded as reasonably effective. On account of the fact that it involved all population groups and all tertiary institutions, this investigation was able to confirm that there was certainly cause for concern over the relatively large number of students whose field of study did not suit their achievement ability. Unfortunately variables such as interest and measured cognitive ability could not be taken into account in the investigation, with the result that the models developed in some cases appear to account for a relatively small percentage of the variation in study success.

In contrast to the investigations referred to above in which the emphasis was mainly on academic achievement, the investigations into the state of the natural science subjects at school level can be distinguished during which attention was paid <u>inter alia</u> to subject

preferences particularly in respect of the subjects Physical Science, Biology and Mathematics.

The findings of the investigations included the following:

(a) Standard 10 pupils who take Mathematics and/or Physical Science and/or Biology have a definite preference for university training above training at another institution if they have an IQ of 110 and higher and obtained 60 % or more in these subjects in Standard 9.

(b) However, where pupils intend continuing their education at a teachers' college or technikon, the choice of institution is not directly related to their IQ or their achievements in any of the subjects Mathematics, Physical Science or Biology.

(c) The investigation also indicated that of all the prospective teachers' college students collectively

- only 15 % fell in the IQ group 120 and higher, and
- only 11, 4 and 19 % respectively obtained 60 % and higher in the subjects Mathematics, Physical Science and Biology in Standard 9.

The investigation also indicated that of all the prospective technikon students

- only 16 % fell under the IQ group 120 and higher, and
- only 10, 11 and 20 % respectively obtained more than 60 % in Mathematics, Physical Science and Biology in Standard 9.

The data of Project Talent Survey indicate that there is a significant difference in the intellectual potential of men and women who continue their studies at teachers' colleges.

7 THE RELATION BETWEEN ACADEMIC SUCCESS AND OCCUPATIONAL SUCCESS

It is almost impossible to report on research regarding any aspect of occupational and career choice without relating it to the considerable

problems concerning a so-called valid and effective criterion for meaningful, realistic, accountable or correct choice. The variety of working definitions or indices referred to in the research literature include the following:

- Subject and study field preference
- Study success at school
- Study success in postschool training
- Successful occupational entry
- Career progress
- Occupational/career achievements
- Work success
- Wages

An extensive series of HSRC reports illustrates the HSRC's contribution in this regard.

Almost without exception the studies all gave rise to the development of predictive models for academic success. However, one aspect to which attention has not yet been paid is the relation between academic success and occupational success. It seems fitting to conclude this brief review of research findings on the factors affecting pupils' success with a few comments on work done elsewhere in this regard.

In their discussion on research regarding the relation between academic and occupational success Samson et al. report that most of the research conducted over the past 50 years could indicate only a slight statistical relation. Nelson as quoted by Samson came to the conclusion that "although technical inadequacies of much research in this area make conclusions difficult to draw, much empirical evidence implies that grade point average is a poor predictor of later vocational achievement".

Samson et al. compared the data of 35 independent investigations undertaken since 1950 and in which statistical relations between academic and occupational success were determined, and calculated mean correlations. From these investigations the following was apparent:

- The arithmetic mean of 209 different correlations between study achievement and occupational success was 0,155 with a standard deviation of 0,176. This confirmed Nelson's finding that the correlations were of a very low order.

- Although significant, academic indicators such as type of degree obtained and examination achievement explained only 4,25 % of the variance in occupational achievement, for instance income, job satisfaction and productivity.

- The prediction validity of academic indices with regard to occupational achievements was slightly higher for occupations in commerce and nursing, but lower for education and engineering. For medical doctors and Ph.D.s the indices were not significant al all.

8 CONCLUSION

From the brief survey of the HSRC's contribution to guidance research various matters emerged that can be regarded as advances in previously established knowledge on factors influencing pupils' occupational choices. For instance there is conclusive evidence that certain measurable variables such as school achievement, aptitude, interest, as well as certain biographical characteristics can be used to develop statistical models by means of which study success and subject preferences can be reasonably effectively predicted. It was also indicated that the influence of persons such as guidance teachers, subject teachers and even parents and friends does not have a particularly marked effect on the occupational choices and career decisions of pupils. Pupils' school subjects and their achievements in these subjects however, prodominantly affect their later choices regarding further study and occupational entry. The finding that there is a close relation between pupils' subject choices and subject achievement on the one hand and their intellectual potential on the other hand can be regarded as one of the breakthroughs in the research of the past few years.

The survey has however also exposed certain shortcomings in the completed research. Particularly striking in this regard was the absence of research on the effect of technology, urbanization, provision of training opportunities, population growth and change of salary structures on the occupational choices and career decisions of pupils. Another very important matter to which no really substantial contribution has yet been made is that of occupational and career success particularly in terms of academic or study success. Most of the research so far has been based on the assumption that study success is one of the important criterions for occupational success, but as indicated in overseas research this criterion appears to have quite a number of limitations. Any research in this regard is of course particularly problematical because of the difficulty of finding an appropriate criterion for occupational success. The situation is further complicated by the growing trend to move away from a one life-time occupation approach toward a so-called multiple career approach. The initial choice or decision in respect of postschool training or first job opportunity is often not an indication of the course that the individual's career will eventually follow. Sometimes, especially in respect of professional fields, an individual's career development occurs progressively liniarly along a vertical axis of opportunities within the same occupation or related occupations. Often, however, the development occurs horizontally over a wide spectrum of various and divergent job opportunities.

From the research mentioned in this report one particularly important matter emerged, namely the way in which use was made of theoretical reference frameworks. In their overview of research literature on career development that received attention in the USA and the UK during 1983, Tinsley and Heesacker reached a number of significant conclusions. One that should be mentioned in this regard is the finding that researchers had apparently failed to place their research firmly within a particular theoretical context.

"All too often the findings of an investigation were difficult to assimilate because they appeared to be unrelated or only weakly related to previously established knowledge" (p. 140).

This allegation probably does not apply only to research on career opportunities but includes other disciplines and themes in the human sciences, and probably also holds for research outside the USA and the UK. As far as HSRC research in the field of guidance is concerned, particularly in respect of the identification and description of factors that play a role in pupils' decision making on choices regarding an occupation or field of study, the results were rarely described in terms of particular theoretical models. A predominantly eclectic approach was usually followed as is evident from the selective handling of a variety of explanatory principles to describe and interpret research results. There is no simple reason for the fairly consistent adoption of this approach, except that it could be the result of an inherent inadequacy of many of the recognized theories to take into account the circumstances and factors unique to the South African economic, social, cultural, political and constitutional reality.

The HSRC's own contribution to theory building in the field of occupational choice and career development, in view of the applied nature of its research, should be seen in terms of the establishment of a particularly extensive and comprehensive base of empirically founded research results. A complexly structured network of mutual relations between variables applying in respect of career development and decision-making processes has been systematically set out and described in a number of research reports. In addition the National Institute for Personnel Research in particular has made a significant contribution towards developing and describing guidance strategies, techniques and methods, some of which are already widely used in industry and education.

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Die RGN onderneem, bevorder, ondersteun en koördineer navorsing op die gebied van die geesteswetenskappe, bepaal navorsingsprioriteite, versprei die resultate van geesteswetenskaplike navorsing, vergemaklik en evalueer die implementering van die resultate van navorsing, stimuleer die opleiding van navorsers, stel die volle spektrum van dissiplines in die geesteswetenskappe ten diens van die inwoners van die RSA en bevorder die wetenskap in die breë.

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